USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2004SD21B

Title: Coupled Carbon-Nitrogen Geochemistry under Reducing Conditions in a Prairie Pothole

Project Type: Research

Focus Categories: Groundwater, Water Quality, Hydrogeochemistry

Keywords: carbon cycle, nitrogen cycle, prairie pothole, dissolved organic carbon, dissolved organic nitrogen, NOM, organic geochemistry

Start Date: 03/01/2004

End Date: 02/28/2005

Federal Funds Requested: $7,000

Non-Federal Matching Funds Requested: $14,375

Congressional District: First

Principal Investigator:
James A. Rice

Abstract

A study proposed to understand the coupled carbon-nitrogen cycle in a prairie pothole wetland. This site is unique because it rapidly becomes anoxic after the water surface freezes in the winter, and rapidly becomes oxic in the spring, and stays oxic, because it is well-mixed by the prevailing winds. It thuis represents a convenient closed chemical reactor to study these reactions. This proposal requests funding for the first year of what will be a three-year project. The overall project has the following objectives:
1. Determine the annual variation in the redox potential of the pothole.
2. Create a nitrogen and carbon mass balance for the pothole.
3. Determine the form of nitrogen present in the dissolved organic matter.
4. Using 15N and 13C labeled compounds, trace the coupled C-N transformations in the pothole under oxic and anoxic conditions.